

What is claimed is:

1. Apparatus for treating monofrequency tinnitus patients comprising:
  - a sound generator having adjustable frequency and amplitude controls for selecting an output tone having a predetermined frequency and amplitude,
  - a pair of headphones to be worn by the patient for coupling the output of said sound generator to said patient to enable the patient to subjectively match the output tone of said generator to the patient's tinnitus tone,
  - a phase shift network for selectively shifting the phase of said output wave form of said sound generator through a plurality of discrete incremental phase shift steps, and
  - means to selectively connect the phase shifted output wave form to the tinnitus patient via said headphones to effect phase shift cancellation between the output of said sound generator and the patient's tinnitus tone in order to diminish or eliminate the tinnitus tone perceived by said patient.
2. The apparatus of Claim 1 wherein said sound generator and said phase shift network are combined with individually selectable outputs.
3. The treatment apparatus of Claim 1 wherein said phase shift network is integrated as an operator selectable function of said sound generator and further including a phase shift control to select phase shift increments in the order of 10 degrees to 180 degrees.

4. Apparatus for treating monofrequency, pure tone tinnitus patients comprising:

sound generator means for generating pure tone wave forms having selectively variable frequencies and amplitudes,

acoustic headset means for coupling the output of said sound generator means to be heard by said patient to enable the patient to subjectively match the frequency and amplitude of the output of said sound generator means to said patient's tinnitus tone,

phase shift means for selectively shifting the phase of said generated tone relative to a selected reference point to bring the generated tone into a reciprocal, canceling relationship with the patient's tinnitus tone, and

means for selectively coupling said phase shifted generated tone to said acoustic means for application to the tinnitus patient.

5. The apparatus of Claim 4 wherein said means for coupling each increment of the phase shifted tone to said patient for a predetermined time period.

6. The apparatus of Claim 5 wherein said means for coupling said phase shifted tone to said patient comprises a time period in the order of ten minutes.

7. A method for medically treating a monofrequency tinnitus patient comprising the steps of:

having the tinnitus patient sound-type his/her tinnitus tone by subjectively comparing the tone and the loudness of an independently generated tone with the patient's tinnitus tone,

effecting a phase shift of the independently generated tone relative to a pre-selected reference through 180 degree phase shift, and

coupling the phase shifted tone to be heard by said patient as the generated tone is brought into a reciprocal phase canceling relationship with said patient's tinnitus tone.

8. The method of Claim 7 wherein the step of subjective patient sound-typing is repeated a plurality of times both as to the frequency and amplitude of said generated tone.
9. The method of Claim 8 wherein the step of subjective patient sound-typing is repeated on a blind basis, whereby the patient is unaware of any readout which would characterize the frequency or amplitude of the generated tones.
10. The method of Claim 8 wherein the step of tone sound-typing comprises a first step of matching the tone frequency and a second step comprises matching the tone loudness.
11. A method of medically treating a monofrequency tinnitus patient comprising the steps of:

having the tinnitus patient adjust the output tone of an external sound generator to subjectively sound-type the patient's tinnitus tone in terms of frequency and loudness,

applying the external sound generated tone to said patient through a headset, phase shifting the generated tone relative to a preselected reference point through a 180 degrees whereby said generated tone is shifted into a reciprocal, phase canceling relationship with the patient's tinnitus tone, and

applying said phase shifted generated tone to the patient for a predetermined time period.

12. The method of Claim 11 wherein the step of applying said phase shifted generated tone comprises a period in the order of at least ten minutes.

13. The method of Claim 11 wherein the step of subjectively sound-typing includes a first step of matching the tone of said patient's tinnitus tone with the externally generated tone and thereafter subsequently includes the step of matching the loudness of said generated tone to the loudness of said patient's tinnitus tone.

14. The treatment apparatus of claim 1 or claim 4 additionally including loudness control means to enable the tinnitus patient to subjectively match the loudness output of said sound generator to the loudness of the patients tinnitus tone.

15. Improved apparatus for medically treating monofrequency tinnitus patients

comprising:

a first sound generator having adjustable frequency and amplitude controls for generating an output tone having a first predetermined frequency and amplitude,

a second sound generator having adjustable frequency and amplitude controls for generating a second output tone having a second predetermined frequency and amplitude,

a dual trace oscilloscope for displaying the output wave forms of said first and said second sound generators and for selectively algebraically summing the output wave forms of said first and said second sound generators,

a phase shift network for selectively shifting the phase of the output wave form of one of said sound generators relative to a predetermined point to achieve a 180 degree phase shift relative to the output wave form of the other of said sound generators, and

acoustic headphones for coupling the output of said phase shift network to the auditory system of said patient to be treated.

16. The improved treatment apparatus of claim 15 additionally including control means for sequencing an output of said phase shift network through a plurality of discrete incremental phase shift steps to achieve said 180 degree phase shift.

17. The improved treatment apparatus of claim 15 additionally including control means for directly shifting the output of said phase shift network into a 180 degree reciprocal, phase canceling relationship with the output tone of said other sound generator.
18. The improved treatment apparatus of claim 17 wherein said control means comprises means for accomplishing said 180 degree phase shift in a single step wise manner.
19. An improved process for medically treating a monofrequency tinnitus patient comprising the steps of:
  - having said tinnitus patient sound-type his/her tinnitus tone by subjectively comparing an output wave form of a sound generator with the patient's tinnitus tone,
  - externally generating a second tone equal in frequency and amplitude to said patient's tinnitus tone,
  - displaying on a dual trace oscilloscope wave forms corresponding to said patient's tinnitus tone and said second generated tone to achieve an algebraic summing and cancellation of said two displayed wave forms when they are in a reciprocal out of phase relationship,
  - shifting the phase relationship of an output wave form of said externally generated second tone relative to a predetermined point by 180 degrees to bring

said externally generated tone into a phase shifted reciprocal, canceling relationship with said displayed patient's tinnitus tone, and

applying said phase shifted generated tone to said patient's auditory system to effect a phase shift, reciprocal canceling relationship between said phase shifted generated tone and said patient's tinnitus tone to diminish or eliminate the tinnitus tone perception by said patient.

20. The improved process of claim 19 wherein the step of shifting includes the additional step of sequencing said shifting through a predetermined number of incremental steps totaling 180 degrees.